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APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A  
FILING DATE.

APPLICATION NUMBER: 60/434,349

FILING DATE: December 17, 2002

RELATED PCT APPLICATION NUMBER: PCT/US03/07247

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12-18-02  
APRC

Practitioner's Docket No. 022255.0028PRO

PATENT

Preliminary Classification

Proposed Class:

Subclass:

JC996 U.S. P.T.O.  
60/434346

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Gregory E. GROSCH and Yuk Nam CHOI

For: DOUBLE SEAL STABILIZER FOR PUSH-IN TUBE COUPLINGS

Box Provisional Patent Application  
Commissioner for Patents  
Washington, D.C. 20231

COVER SHEET FOR FILING PROVISIONAL APPLICATION  
(37 C.F.R. § 1.51(c)(1))

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 C.F.R. § 1.51(c)(1)(i). The following comprises the information required by 37 C.F.R. § 1.51(c)(1):

1. The following comprises the information required by 37 C.F.R. § 1.51(c)(1):
2. The names of the inventors are (37 C.F.R. § 1.51(c)(1)(ii)):
  1. Gregory E. Grosch
  2. Yuk Nam Choi

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EXPRESS MAILING UNDER 37 C.F.R. § 1.10\*

Express Mail label number is mandatory  
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I hereby certify that this paper, along with any document referred to, is being deposited with the United States Postal Service on this date December 17, 2002 in an envelope addressed to the Commissioner for Patents, Washington D.C. 20231 as "Express Mail Post Office to Addressee" Mailing Label No. EV193157315US.

Date: December 17, 2002

  
Kristin J. Azcona

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**\*WARNING: Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).**

**"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.**

3. Residence addresses of the inventors, as numbered above (37 C.F.R. § 1.51(c)(1)(iii)):

1. 14 Lagunita Drive  
Laguna Beach, CA 92651  
USA
2. #676-7 Kojan-Dong  
Namdong-Gu Inchon

4. The title of the invention is (37 C.F.R. § 1.51(c)(1)(iv)):

**DOUBLE SEAL STABILIZER FOR PUSH-IN TUBE COUPLINGS**

5. The name, registration, customer and telephone numbers of the practitioner are (37 C.F.R. § 1.51(c)(1)(v)):

Name of practitioner: Robert D. Fish  
Reg. No. 33880  
Tel. 714-641-5100

6. The docket number used to identify this application is (37 C.F.R. § 1.51(c)(1)(vi)):

Docket No. 022255.0028PRO

7. The correspondence address for this application is (37 C.F.R. § 1.51(c)(1)(vii)):

Robert D. Fish  
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611 Anton Blvd., 14th Floor  
Costa Mesa, CA 92626  
USA

8. Statement as to whether invention was made by an agency of the U.S. Government or under contract with an agency of the U.S. Government. (37 C.F.R. § 1.51(c)(1)(viii)).

This invention was NOT made by an agency of the United States Government, or under contract with an agency of the United States Government.

9. Identification of documents accompanying this cover sheet:

A. Documents required by 37 C.F.R. § 1.51(c)(2)-(3):

Specification:	No. of pages	2
Drawings:	No. of sheets	1

B: Additional documents:

None

10. Fee

The filing fee for this provisional application, as set in 37 C.F.R. § 1.16(k), is \$80.00 for a small entity.

Applicant is a small entity.

11. Small entity assertion

Small entity status is asserted for this application by payment of the small entity filing fee under § 1.16(k). 37 C.F.R. § 1.27(c)(3).

12. Fee payment

Fee payment in the amount of \$80.00 is being made at this time.

13. Method of fee payment

Check in the amount of \$80.00.

Please charge Account No. 502191 for any fee deficiency.

Date: December 17, 2002

  
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611 Anton Blvd., 14th Floor  
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## DOUBLE SEAL STABILIZER FOR PUSH-IN TUBE COUPLINGS

### Field of the Invention.

5 The field of the invention is tube couplings.

### Background

Push-in tube couplings have been known for many years that rely on an "O"-ring to form a seal between the tube and the coupling. The couplings are commercially available in in-line, elbow or T-couplings or tube closures configurations. Such couplings have the advantage 10 of quick connection / disconnection, and are able to withstand significant pressures and relatively high temperatures. Figure 1 depicts a novel coupling, in which numerals below 100 depict elements that are old in the art, and numerals above 100 depict novel elements.

In general, such devices have a body 1 with a throughway open at one end, and an internal shoulder or tube stop 6 that limits the depth the tube 2 can be inserted into it. The tube 15 connector body has an end cap 5 and collet 8 with openings through which the tube 2 can be inserted. The end cap 5 has a tapered cam inter surface to receive a collet with resilient arms for locking the tube in the coupling. The collet 8 is compressed against the tube by a slight withdrawal of the tube and collet from the coupling body. The collet can be depressed into the body to release the tube.

20 An "O" ring 3 seal is provided in the coupling body 1, and it is supported and positioned by a second internal shoulder 7 in the body. The "O" ring 3 in the coupling body engages the outer surface of the tube 2 to form a seal around the tube. The "O" ring 3 simultaneously engages the surface of the body to form the air and liquid tight seal of the tube in the coupling. The "O" ring 3 is protected from the ends of the collet by means of a washer 4 that prevents the end of 25 tube 2 from coming in contact, and damaging the face of the "O" ring during insertion.

This arrangement provides the opportunity for contamination of the "O" ring seal during storage, during handling of the coupling and during insertion of the tube in the coupling body. Contamination of the "O" ring provides small breaches in the seal in which liquids and gases can

penetrate under high temperatures and pressures causing the coupling to leak. This arrangement also provides for stresses to be placed on the "O" ring seal from lateral forces placed on the tube outside of the coupling which can cause the "O" ring to deform providing for small breaks in the seal between the "O" ring and the tube and or the "O" ring and the body of the coupling

5      compromising the integrity of the seal causing the coupling to leak.

Thus, known push-in quick-connect couplings tend to leak if the tubing is bowed at or near the coupling, if the end of the tubing is not completely inserted into the coupling, or if the tubing is dirty or damaged. As a result, quick connect couplings of this type are not widely used in a manufacturing environment, including especially that for marine and RV applications.

10      Summary of the Invention.

As shown in Figure 1, I have now devised an embodiment that is inserted into the body of push- in quick-connect couplings 1, which may be used independently or combined in some manner.

Double seal stabilizer 110 includes an integrally molded one piece stabilizer stem 120 and stem base 118 that fits inside the coupling body 1 and is seated on the tube stop 6 . The stabilizer 110 has an "O"-ring 112 seated in a retaining indentation or race 119 in the base 118 of the stem 120. The "O"-ring 112 provides a seal between the inner surface 11 of the coupling 1 and the stabilizer 110. Once the tube 2 is inserted over the stabilizer 110 the stabilizer travels with the tube 2 inside the body 1 of the coupling when the stabilizer 110 and stem are under pressure. The stabilizer 110 provides support for the tube 2 when lateral forces are applied to it reducing the distortion of the "O"-ring 3.

A second "O"-ring 130 seated in a retaining indentation or race 119 at the intersection of the stabilizer stem 120 and the stem base 118 . "O"-ring 130 seals the open end of tube 2 against the top 126 of the stem base 118 of the stabilizer 110. The addition of the double seal stabilizer insert 110 greatly reduces the possibility that the coupling will leak due to "O"-ring contamination or deformation. The bottom or leading edge of the stem base 122 has a chamfer 124 that facilitates insertion of the stabilizer 110 during assembly of the coupling.

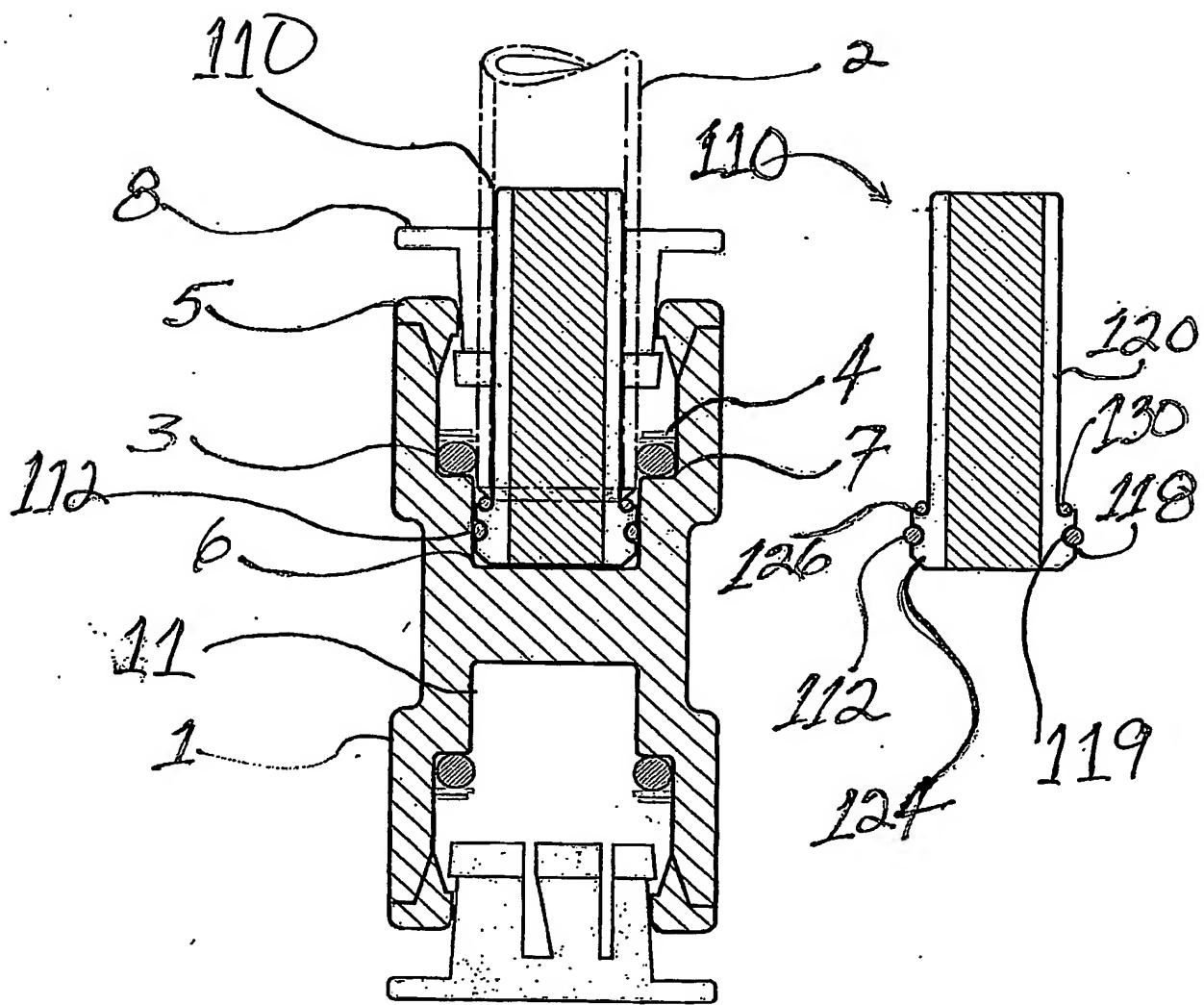


FIG. I